CLAIMS

1. A method for preparing an oxygen radical-containing calcium aluminate film, characterized in that it comprises subjecting a powder of oxygen radical-containing calcium aluminate to thermal spraying.

2. The method according to Claim 1, wherein the oxygen radical content in the oxygen radical-containing calcium aluminate is at least 10^{20} cm^{-3}.

3. The method according to Claim 1 or 2, wherein the main mineral phase in the powder of oxygen radical-containing calcium aluminate is crystalline $12CaO \cdot 7Al_2O_3$ ($C_{12}A_7$).

4. The method according to Claim 3, wherein the $12CaO \cdot 7Al_2O_3$ ($C_{12}A_7$) is obtained by a solid phase reaction of a Ca source and an Al source in a mol ratio of Ca:Al being from 0.77:1 to 0.96:1.

5. The method according to Claim 4, wherein the solid phase reaction is carried out in a dry oxidizing atmosphere having an oxygen partial pressure of at least 10^4 Pa, a steam partial pressure of at most 10^2 Pa and a temperature of from 1,200 to 1,415°C, or after the solid phase reaction, the system is maintained in such a dry oxidizing atmosphere.

6. The method according to any one of Claims 1 to 5, wherein the thermal spraying is carried out by plasma spraying.

7. A laminate having an oxygen radical-containing

calcium aluminate film formed on a substrate, characterized in that the oxygen radical-containing calcium aluminate film is formed by subjecting a powder of oxygen radical-containing calcium aluminate to thermal spraying.

8. The laminate according to Claim 7, wherein the oxygen radical-containing calcium aluminate film has a thickness of from 5 to 200 μm.

9. The laminate according to Claim 7 or 8, wherein the oxygen radical content in the oxygen radical-containing calcium aluminate is at least 10^{20} cm^{-3}.

10. The laminate according to any one of Claims 7 to 9, wherein the substrate is a sintered body of zirconium oxide.